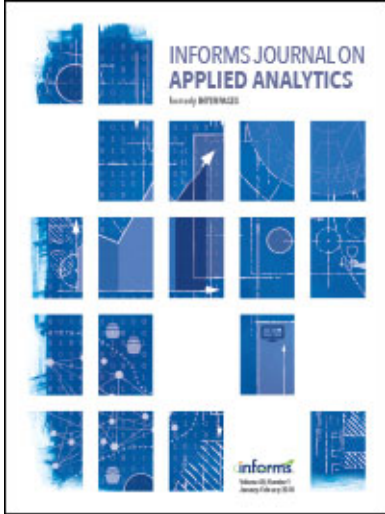




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Book Reviews

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Book Reviews

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$$\frac{1}{\beta} \Gamma^{\alpha} \times \approx + \div \neg \beta \subset \mu = \iota \rho \setminus + \sigma \cdot x \quad \mu \omega \epsilon \& \mu ? \lambda \epsilon^{\epsilon} < \mu \Sigma = \phi \zeta \pi^{\rho} \\ \beta \Sigma \wedge \div \lambda \pi^{\epsilon}) \sigma \leq \lambda \approx + \circ \lambda \phi \sigma \alpha \geq \lambda \Gamma^{\alpha} \epsilon \iota \circ \cap \iota \omega - \phi \Delta \epsilon^x - \beta \mu \div \setminus ? + \rho \approx$$

The range of books reviewed is wide, covering theory and applications in operations research, statistics, econometrics, mathematics, computers, and information systems (no software is reviewed). In addition, we include books in other fields that emphasize technical applications. Publishers who wish to have their books and proceedings reviewed should send them to Professor Benjamin Lev, School of Management, The University of Michigan-Dearborn, 4901 Evergreen Road, Dearborn, Michigan 48128-1491. We list the books and proceedings received; not all books received can be reviewed because space and time are limited. Those who would like to review books are urged to send me their names, addresses, and specific areas of expertise. We commission all reviews and do not accept unsolicited book reviews. Readers are encouraged to suggest books that might be reviewed or to ask publishers to send me copies of such books.

KEENEY, RALPH L. 1992, *Value-Focused Thinking: A Path to Creative Decisionmaking*, Harvard University Press, Cambridge, Massachusetts, 406 pp., \$35.00.

There is typically a huge disparity between (1) resources spent turning out numbers and (2) resources spent attending to the purpose of the analysis. This book should help achieve more balance. The main message is that substantially more time should be invested in eliciting values and proactively pursuing goals.

Keeney's writing is clear and augmented with excellent figures and tables. His style is similar to that of Russell Ackoff, another popular MS/OR author. Most of the discussion should be comprehensible to anyone in management. The intended audience includes "thoughtful decisionmakers" who may "feel somewhat relieved that there are some formal techniques that may assist them." In some places, Keeney relies on mathematics—still very accessible—and the reader is usually forewarned that he or

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she may wish to detour. The book is still technical, but special notations and mathematics are minimal.

I was attracted to the book because of the word *value* in the title and Keeney's reputation as a multi-criteria decision-making guru. Organizations almost universally neglect values in defining decision policy. While expected monetary value is adequate for most corporations (my opinion), governments and individuals necessarily must contend with multiple objectives. This book shows how to do so.

Keeney asserts that traditional analysis is alternative-focused thinking. He argues that this approach is inadequate. "It is values that are fundamentally important in any decision situation. Alternatives are relevant only because they are means to achieve your values." A recurring theme is that we should actively and creatively seek decision opportunities. First decide what you want (values), then figure out how to get it (alternatives).

Keeney amply illustrates "value-focused-thinking frameworks." These relate strategic objectives, fundamental objectives, means objectives, and the strategic decision context. While the reader may differ in their use of specific words, Keeney defines the terms he uses thoroughly and uses them consistently.

Hierarchically structured objectives provide the basis for value modeling. The book is clearly structured; its 13 chapters are divided into four parts: concepts, foundations, uses, and applications. Keeney builds credibility for his approach through prolific use of examples. A separate index mentions about 120 applications.

Of particular interest was the chapter

"Quantifying objectives with a value model." The explanation of independence concepts is especially well done. Keeney further explains building the value function in the following chapter, "Uncovering hidden objectives." He finishes adding meat to the skeleton later in the chapter "Selected applications." Keeney devotes one whole chapter to identifying and structuring the strategic objectives of B. C. Hydro, an electric utility and integrating them into a value function. Later, he presents a convincing history of using this approach for his personal decisions.

This contribution focuses on procedures for articulating objectives. There is only brief mention of probability and expected utility or the use of probability as an attribute. Time preference is ignored. Those and other technical details can be found in his republished, now-classic work, *Decisions with Multiple Objectives, Preferences and Value Tradeoffs* [Keeney and Raiffa 1976].

Social responsibility is a much appreciated theme throughout. Applying his approach will improve government. Keeney takes issue with shortsighted legislation, such as the Clean Air Act in which "costs of achieving air pollutant levels should not be considered in setting standards for those levels." Acceptable social solutions must be consistent with society's values.

This is an idea book. It is worth the investment solely as an inspiration source for unsticking decision dilemmas: Clarifying values leads to creating new alternatives. I'm recommending this book for executives and consider it a "must read" for students and MS/OR practitioners concerned that their applications have real-world

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relevance and value.

Reference

Keeney, Ralph L. and Raiffa, Howard 1976, *Decisions with Multiple Objectives: Preferences and Value Tradeoffs*, John Wiley and Sons, New York, reprinted by Cambridge University Press, 1993.

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WEISS, JOSEPH W. and WYSOCKI, ROBERT K. 1992, *Five-Phase Project Management: A Practical Planning and Implementation Guide*, Addison-Wesley Publishing Company, Reading, Massachusetts, 121 + xiii pp., \$19.50.

Five-Phase Project Management, according to the preface, was written as a ready reference for anyone in a professional or project setting. On the same page of the preface, the authors claim it will also aid these persons to cope with “. . . limited budgets, time demands, deadlines, and resource constraints . . . with easy-to-use checklists and tips . . .” This is not a text for an in-depth study of project management techniques. In fact, the authors provide very few advanced concepts of accounting and network analysis. A one-page appendix contains a discussion of available software. In that respect, Gido [1985] has more depth in analysis and software; Rosenau [1992] has more depth in the use of software and many of the same tips.

However, the book is well organized for on-the-job usage with excellent ideas about deliverables at each stage of the project's 25 steps. A beginning manager or assistant would do well to follow this guide until he or she gained the experience to do

otherwise.

The book opens with a short discussion about what a project is as opposed to a program or a task. The five phases, each with five action steps, are introduced along with the deliverables from each phase. The authors use their 15+ years each of project management experience well. They discuss each step along with the behavioral problems often encountered. The references they list show a high quality of theoretical understanding.

The most useful and unusual portions of this book are the “Quality control checklists” and “Acid test” questionnaires after each of the main chapters. These tests, along with the suggested forms and modified charts, will keep any project manager happy. These tools are simple, understandable, and usable.

A problem with this book, as with the other two referenced, is that they do not address real problems at a deep level. As an example—part of chapter 7 deals with work package scheduling and balancing the work load on the project team. The authors “solve” the problem of balancing by using work-load profile charts. When one team member has an excessive work load, the authors suggest considering “. . . scheduling alternatives for non-critical path activities in order to balance the resource requirements across the entire project.” There is no reference at this point to *how* to do this. The figures in the book show a simple rearrangement. The idea that there are some techniques, such as assignment or 0-1 programming, to aid the manager is nowhere to be found. These procedures may well be beyond the scope of an introductory text, but they are

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needed for completeness and known by the authors.

The suggested audience for this book is project teams being formed from previously un-empowered employees. Those who do not have a solid basis in accounting or operations research techniques will find this book a good first walk-through of project management. For many entrepreneurs and small businesses, this may be the perfect guide for small to intermediate projects; the low price also helps. For those who are guiding large projects, the lack of theoretical depth or appropriate citations would leave them short-changed.

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Gido, Jack 1985, *An Introduction to Project Planning*, second edition, Industrial Press, New York.

Rosenau, Milton D., Jr. 1992, *Successful Project Management: A Step By Step Approach with Practical Examples*, Van Nostrand Reinhold, New York.

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LOUIS, RAYMOND S. 1992, *How to Implement Kanban for American Industry*, Productivity Press, Cambridge, Massachusetts and Norwalk, Connecticut, 116 pp., \$39.95.

In this book, Louis addresses various issues of applying the just-in-time concept with special emphasis on the use of Kanban techniques in the Western world, where the cultural, geographical, and economical settings are substantially different from those in Japan where the Kanban techniques were first originated.

Applications of Kanban techniques in one form or another have already pro-

duced remarkable results in the manufacturing and service sectors, gaining widespread recognition worldwide. This book, as far as I am aware, is first to tackle the subject area in such a simplistic and down-to-earth manner. I feel that it is not meant for use as a textbook for undergraduates because it does not cover enough for the curricula at that level. However, I do find this book a useful reference for engineers, managers, management consultants, and engineering teachers. As Louis stresses in the foreword, it is a how-to book; it manages to give useful tips and comprehensive references to manufacturing practitioners. Personally, I would rather use this book as a "box of tricks" from which ideas and experience can be extracted while planning and implementing the just-in-time methodology. It is certainly a useful guide book for young engineers. The author presents a classical review of contemporary practices in managing materials and suppliers in the first two chapters. Chapters 3 to 5 suggest some practical fixes that can help one to tackle problems in day-to-day logistics and control of materials procurement. The explanation of bar codes applications to bypass certain error-prone keyboard entries and the introduction of electronic data interchange (EDI) with a view to moving a step closer to paperless trading provides some feasible alternatives for improving operations. The analytical models in calculating lot sizes, safety stock, and time factors outlined in chapters 6 to 8 introduce the mathematical basics for coping with varying operating environment and product characteristics.

The author also highlights some do's and don'ts in handling Kanban implemen-

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tation, which he refers to as the “only arena that really counts.”

Louis discusses some continual audit and review techniques of Kanban installations towards the end of the book. On the whole, he provides some light-hearted treatments on a topic that one hears a lot about but is often puzzled as to how to put the techniques into practice. The book can also be used by manufacturing personnel in their pursuit of improved productivity for its case studies.

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LANDVATER, DARRYL V. 1993, *World Class Production and Inventory Management*, Oliver Wight Publications, Essex Junction, Vermont, 272 pp., \$42.50.

If you want a primer exposition to production and inventory management, this book is for you. In this book, Landvater presents a compilation of real-life examples from major companies in production and inventory management and provides strategies and techniques for managing a manufacturing enterprise.

The book is divided into 11 chapters and includes an introduction and historical account of the emergence of manufacturing management and chapters on rethinking business as usual, sales and operations, demand management, master production scheduling, plant scheduling, and supplier scheduling.

The strength of the book is that it is written for the practitioner and focuses on the general aspects of the technology with-

out requiring mathematical or statistical coverage. It is full of how-to advice and has abundant guidelines and best-in-class examples from major companies. The emphasis throughout the book is the integration of key technology (JIT, MRP II, sales and operating planning, and so forth) with production and inventory management for problem solving by using proven manufacturing techniques to improve the overall competitiveness of the firm.

Overall, Landvater provides a well-balanced review of the major aspects of production and inventory management techniques. However, in some chapters the depth of coverage is less than desirable—he tends to dwell on the obvious. In addition, he could have added a separate chapter on total quality management (TQM) in production and inventory management—though he mentions TQM in some chapters—to make it more current and relevant.

This book is suitable as a source book for practitioners and as additional reading for undergraduate and graduate students in production and operations related courses.

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SHERBROOKE, CRAIG C. 1992, *Optimal Inventory Modeling of Systems, Multi-Echelon Techniques*, John Wiley and Sons, New York, 274 pp., \$59.95.

This book is a remarkable review and summary of nearly 30 years' work on applied multi-echelon inventory theory. Sherbrooke has been a key worker in this field and has influenced both research and

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practice. Reading this volume indicates why.

First, the book is a model of clarity and coherence. Each chapter has a clear statement of direction and a precise and helpful summary. As the author progressively elaborates the theory, he explains the reasons for each step and identifies the limitations. The mathematics is often complex and in some places rather terse, but he always keeps the reader informed about what is going on and why. Second, Sherbrooke makes liberal use of numerical examples to support the argument and provides problems at the end of each chapter. Finally, the writing is lucid and accurate.

The central subject of the book is the determination of stock levels for repairable items in complex systems. The context of much of the work described has been the management of high-value spare parts for the US military, although the author also presents new analysis which is framed around the operation of the planned space station *Freedom*. Sherbrooke emphasizes the differences between these situations and those frequently considered in manufacturing systems: for example, calculating batch sizes is largely irrelevant, as the economic order quantity is usually one. He presents the theory in terms of a systems perspective of inventory control, where the principal goal is to generate cost-availability curves for the system as a whole. He contrasts this with the traditional item approach, in which each part is considered independently. The theoretical development is based around the infinite channel queuing assumption (so that repairs do not compete for limited capacity), which per-

mits the use of Palm's theorem. From this foundation, Sherbrooke builds up successive layers of sophistication, incorporating, among other factors, varying demand rates, multi-indenture systems, wear-out processes, and cannibalization.

The specialist focus of the book will limit its appeal within the MS/OR community, but Sherbrooke stresses that the theory should be used creatively. Throughout, he emphasizes the position of the practical logistician, in contrast to that of the mathematical purist. Indeed, if the book has a failing it is that the excellent chapter on implementation deserves more space.

In summary, this book will be a useful addition to libraries and an important reference for inventory specialists. Even those concerned with other problem domains may benefit from the distilled wisdom it offers.

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LUND, D. and ØKSENDAL, B., eds. 1991, *Stochastic Models and Option Values: Applications to Resources, Environment, and Investment Problems*, North-Holland, Amsterdam, 301 pp., \$69.00.

This book collects papers presented to an international conference in Norway during August 1989. The focus of the conference was "the theory of investment in dynamic models of uncertainty, its foundations in mathematics, and its applications."

One common method for determining whether or not to undertake an investment is to compare the expected present value of

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the return on the investment to the cost of that investment. The problem with such an analysis is that it ignores the possible value inherent in postponing the investment until more information becomes known. The value of the flexibility of postponing the investment results from the assumptions that future returns are uncertain and that the investment, once made, is largely irreversible. One complicating factor in the valuation of an investment is the "net convenience yield" for that investment. For example, investing in a larger inventory of some commodity may provide a firm with the ability to handle local shortages more efficiently and to reduce ordering and delivery costs, although storage costs usually increase. These benefits would be available only to those who physically possess the commodity and not to those who merely hold a contract for future delivery of the commodity. These benefits are valuable and should be considered in investment decisions.

The above discussion gives a taste of some of the issues addressed in this book. The unifying themes throughout this collection of papers are the recognition of various "option values," the attempt to model their effects on optimal investment decision making, and the quantification of these values. One can understand many of the concepts in this book intuitively. Most of the authors provide adequate interpretation of the mathematical models using common economic terminology. In an introductory article, Lund does a good job surveying and summarizing the book's contents. However, the reader should be forewarned that some of the mathematics are quite sophisticated and technical. For

example, some knowledge in stochastic differential equations would be useful. Complete understanding of Øksendal's brief introduction to stochastic control theory requires considerable mathematical background. For readers who would like to pursue this line of research but lack the necessary background, this book, including its references, points the way toward further study.

The book is nicely typeset and indexed by subject and author. This collection of papers makes a useful contribution to the literature of economics and should be of wide interest to economists, management scientists, and mathematicians who would like to see how their tools are being applied.

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